With the outbreak of novel 2009 pandemic virus, the diagnosis and the characterization of the first case in Korea was completed within a week and several research projects were immediately launched in the diagnosis, vaccine development, and pathogenicity study using the influenza A/Korea/01/2009(H1N1) virus. Especially for 2009 pandemic virus, mammalian pathotyping using mouse and ferret has been performed in BSL-3 facility in KNIH. Prepandemic period was the preparatory for capacity building for intensified influenza research in KNIH. In post pandemic period, research field will be more focused on vaccine and pathogenesis of influenza in human based on the strong infrastructure built through previous research products as well as capacity building in diagnosis and surveillance to detect new influenza virus in humans.

doi:10.1016/j.phrp.2011.11.025

Climate Change and Malaria Transmission in Thailand

Jetsumon Sattabongkot Prachumsri

Climate warming can change the geographic distribution and intensity of the transmission of vector-borne diseases such as malaria.
The heterogeneity in malaria trends probably reflects the multitude of factors that can drive malaria transmission. There are studies of climate change that probably alter the spread and transmission intensity of malaria in Africa.
The transmitted parasites usually benefit from increased temperatures as both their reproduction and development are accelerated. These finding suggest that the abundance, distribution and malaria transmission of different malaria vectors are driven by different environmental factors.
Malaria transmission and climate changes in high and low endemic areas in Thailand will be discussed.
A better understanding of the specific ecological parameters of each malaria mosquito species will help define their current distributions, and how they may currently and prospectively be affected by climate change, interventions and other factors.

doi:10.1016/j.phrp.2011.11.026

Climate Change and Vector-Borne Infectious Diseases : Future Prospect of Northern Expansion of *Aedes albopictus*

Mutsuo Kobayashi
Director, Department of Medical Entomology, National Institute of Infectious Diseases, Toyama 1-23-1, Shinjuku-ku, Tokyo 162-8640, Japan.

Asian tiger mosquito, *Aedes albopictus*, is one of vectors of the dengue and Chikungunya viruses and was common mosquitoes in Southeast Asia, Far East including Japan. During past two decades the distribution areas of *Ae. albopictus* clearly expand to worldwide by world trading of used tiers. In Japan *Aedes albopictus* distributed widely in Honshu Island of Japan with its northern limits between 38° to 40° degrees north. The factors affecting distribution of the species in Japan were studied using the GIS and showed an annual mean temperature higher than 11 C^o is most related to the northern limit. During 1998−2006, larval surveillance was carried out in more than 30 urban and rural areas in Tohoku district, the northern limit clearly moved to northward. The future expansion of the distribution of *Ae. albopictus* were analyzed using 1-km mesh climate data prospected by MIROC(K1) model in 2035 and 2100. From these analyses, the distribution of the mosquitoes widely expands in the lowland areas of Aomori Prefecture, most northern Honshu district in 2035. *Ae. albopictus* will also invade to Hokkaido Island crossing the Tsugaru Strait in 2100. This means that risk areas in dengue and Chikungunya outbreak clearly expand in the northern parts of Japan. The population density of the mosquito is one of the important factors to predict the possibility of outbreak of mosquito borne diseases. *Ae. albopictus* is not a simple nuisance mosquito, so we should recognize the importance of this mosquito species as an important vector of viral diseases, dengue and chikungunya. The technical report published by ECDC in 2009 entitled "Development of *Aedes albopictus* risk map" completely adopted our criterion, 11 C^o as a northern expansion limit in Europe and North America.

doi:10.1016/j.phrp.2011.11.027

Management and Surveillance of Disease Vectors in the Republic of Korea

E-Hyun Shin
Division of Medical Entomology, Korea National Institute of Health, Osong, Korea.

As management measures for vector borne diseases, vector surveillance system and vector control system are created with management of infectious diseases such as malaria, Japanese encephalitis and scrub typhus.

Surveillance for disease vectors

Malaria vector surveillance is conducted by collecting from 16 sites around malaria risk areas where the disease occurs. The seasonal population density of vector mosquitoes and infection rate of *Plasmodium* are conducted. Japanese encephalitis vector surveillance is the oldest vector surveillance system in Korea. It is currently being conducted at 39 sites nationwide, and it provides the precautionary attention at first appearance date

and the alarm based on the number and rate of vector species. To monitor vectors that could be coming from overseas, various vectors (mosquitoes, cockroaches, rodents etc) are collected at the National Quarantine Station (19 sites) located at harbors and airports. And in 2009, to effectively cope with climate change, 3 vector surveillance centers were established in Honam, Yeongnam and Jeju areas. Researchers in each center were educated on how to perform this project, and monitoring of vector mosquitoes and mites for West Nile virus (WNV), JE virus and *O. tsutsugamushi* is carried out.

Performance of national vector control and surveillance

To construct and strengthen standard laboratory system for disease vector control, supervision for renovating vector control methods under field condition, national monitoring on pesticide susceptibility and resistance of disease vector mosquitoes, issue of guideline and manual for vector control and management, national advisory committee for effective vector control were carried out. The education and manual provide background information that help workers to identify the vectors species, understand the vector ecology and apply the appropriate control measures. Practical information is given on a variety of control measures.

Construction of Vector-Net system

There is need to establish a comprehensive surveillance and management system (Vector-Net) on vector borne diseases that could efficiently respond to diseases from climate and environmental change by drawing up pest control strategies. This system is a united vector borne disease control that being connected vectors and patients surveillance, pathogen diagnosis, geographic information, regional customized eco-friendly vector control with infectious disease vector.

doi:10.1016/j.phrp.2011.11.028

Tuberculosis Research in Korea

Sang-Nae Cho
Yonsei University College of Medicine, Seoul , Korea.

Korea has been listed as an example of countries demonstrating how successful tuberculosis (TB) control programs could reduce the prevalence and mortality of TB. With tremendous efforts led by the Korea Institute of Tuberculosis, the prevalence of TB reduced from over 5% in 1965 to 1% in 1995, and now about 0.3% in 2010. All these remarkable achievements could not be made without endless efforts for operational research activity including the nationwide TB prevalence surveys which were carried out every five years from 1965 to 1995. During the same period, there were also numerous research activities on drug trials, new diagnostic tests, and BCG vaccine whose results were then translated into the better TB control programs.
As the prevalence of TB decreased to less than 1%, however, interests in the TB control programs and research among scientists and clinicians were also reduced markedly leaving basic and clinical research idle. Coincidently, there has been no significant decrease since late 1990s leaving TB control community a little bit nervous about the situation. Without the nationwide survey, it has been difficult to know or estimate the TB burden in the country. Emergence of HIV infection and a steady increase in multi-drug resistance (MDR)-TB in Korea and oversea countries have made a big alarm to scientists and clinicians around the country last several years.
With a recent boost in biomedical research funds led by the Ministry of Health and Welfare, research grants and contracts had been also available to TB research. Even though there was only a handful of basic and clinical researchers, their research topics include: (i) molecular diagnosis for detection of DNA or mRNA of *Mycobacterium tuberculosis*, species identification, and detection of mutations in the genes which are associated with drug resistance, whose results have been translated to several diagnostic kits in the market. (ii) new drug development against *M. tuberculosis* infection. A couple of drug candidates were licensed out and several more on the preclinical development stages. (iii) new vaccine development including identifying vaccine candidate antigens and adjuvant inducing cell-mediated immune responses toward development of subunit or DNA vaccines. (iv) clinical trials with new drug candidates against MDR-TB and XDR-TB as an effort to identify life-saving drugs. (iv) basic research for understanding host-parasite interaction between M. tuberculosis and human whose results can be translated into new diagnostics, drugs, and vaccines. In addition, there were also a group of scientists working on non-tuberculous mycobacterial infection which covers 7-10% of mycobacterial diseases in Korea. Hopefully, all these research activity in both basic and clinical settings can be extended and boosted markedly in the foreseeable future.

doi:10.1016/j.phrp.2011.11.029

Novel Trend in Vaccine Research

Daniel Douek
Senior Investigator and Chief, NIAID, NIH, USA.

Even before the partial success of a preventive HIV vaccine in a recent Phase III clinical trial, there has been an active discovery effort to determine one or more immune correlates of protection in HIV infection. This effort has been hampered by the lack of natural protective immunity against HIV. I will discuss lessons learned from the STEP and RV144 trials and how the Vaccine Research Center is proceeding with the HVTN505 study. I will discuss efforts to elicit broadly neutralizing antibodies and the importance of establishing correlates of immunity from studies in humans.

doi:10.1016/j.phrp.2011.11.030